

QUANTITY FOOD PREPARATION

POULTRY, MEAT AND FISH PREPARATION

a. Poultry

The composition of poultry (muscle tissue, connective tissue, etc.) is similar to that of meat. The flesh of poultry and game birds is muscle tissue, as is the flesh of beef, lamb, veal, pork, and game. Its composition and structure are essentially the same as those of meat. The muscle tissue is composed of:

- Water (about 75 percent)
- Protein (about 20 percent)
- Fat (up to 5 percent)

Cooking methods for poultry

Baking and roasting: Baked chicken or turkey parts are treated like roasted poultry. Chicken parts are sometimes coated with seasoned crumbs or flour and rolled in fat before baking.

Broiling and Grilling: Tender, young poultry items may be cooked on the grill or broiler using the same procedure as for steaks and chops. Use lower temperatures than for meats. The outside can be burned easily before the inside is cooked through. Poultry skin, in particular, browns and then burns very easily. For quantity production, broiled chicken is sometimes finished in the oven on sheet pans, preferably on rack.

Simmering and poaching: Simmering and poaching are both methods of cooking in a liquid. The major difference is the temperature. In simmering, the liquid is a little below the boiling point and bubbling very gently. In poaching, the temperature is even lower, and the liquid is not really bubbling. Also, less liquid is usually used for poaching

Braising: A moist-heat cooking method, braising may be used to tenderize tough poultry products. Also, as for veal and pork, it can be used to provide moistness and flavor to tender poultry items.

Determining Doneness

Poultry should always be heated until well done to enhance flavor and to minimize the risk of food-borne bacterial illnesses. Doneness may be determined by internal temperature, color changes, and/or touch and time/weight

- a. Internal Temperature:** The best way to check poultry for doneness is to use a meat thermometer. It should be inserted into the thickest part of the breast, although it can also be inserted into the inner thigh. In either case it should not touch bone or fat. Poultry is sufficiently cooked when the internal temperature reaches a minimum of 165°F (74°C) for at least 15 seconds.
- b. Color Change:** When the skin on oven-roasted chicken or turkey reaches a golden brown color, it is time to test for doneness. The juices coming out of the bird should have turned from pink to clear, and a bit of bone should be showing on the tip of the legs.
- c. Touch:** When pressed firmly with one or two fingers, the well-done bird's flesh will feel firm, not soft. White meat may be firmer than dark meat.
- d. Time/Weight Charts:** Time/weight charts appear on the packaging of all frozen and many fresh birds. It takes about 1½ hours in a 350°F (177°C) oven to thoroughly cook a 3½-pound chicken. Preparation times for turkeys depend on their weight

b. Meat

Meat is composed of three basic materials: water, protein, and fat. On average, lean muscle tissue is about 75 percent water, 18 percent protein, and 3 percent fat. The eventual texture and taste of the cooked meat depend on the amount of fat and water in the tissue and on the kinds of proteins. In general, the most tender cuts of meat have more fat and less

fibrous muscle. Tougher tissue from older animals often has more flavor. Both limitations can be overcome by using the proper cooking methods

Especial Variety of Meat

Kosher Meats: Kosher meats are from certain animals (cattle, sheep, and goats, but not swine) designated as clean that have been slaughtered according to Jewish religious practices dating back more than 3,000 years.

Halal Meats: As discussed in Chapter 1, halal is defined as —permitted, and it often refers to meat. Most meat is allowed except pork and carnivorous animals with fangs (lions, wolves, tigers, dogs, etc.). Acceptable animals need to be slaughtered according to Muslim guidelines.

Organic Meats: The demand for the more expensive organic meats is increasing. Organic beef standards were established in 2002 by the United States government. Organic meat is defined as being derived from cattle fed only milk, grasses, and grains from birth to slaughter

Processed Meats: About one third of all meat is processed; meaning it has been changed from its original fresh cut. Ham, sausage, and bacon are the most popular processed meat products. Other examples of processed meats include salami, bologna, bratwurst, and pastrami

Effect of Heat on Meat

Meat is usually the most expensive portion of a meal; therefore, its preparation is usually given extra consideration. It's important to observe the changes in the meat during heating. Effects of heat on meat include:

Tenderness and Juiciness: Cooking meats at the correct temperature for the right amount of time will maximize their tenderness, juiciness, and flavor. Although heat makes meat more palatable, exposing it to high temperatures for too long will toughen, shrink, and harden meat because such exposure shortens muscle fibers, denatures proteins, and causes the

meat to dehydrate. During heating, the collagen molecule begins to denature at 102°F (39°C), and collapses at 149°F (65°C), resulting in a considerable loss of volume and length in the meat. Another factor contributing to meat shrinkage is the freeing of some water as the meat's other proteins denature and lose their water-binding capacity. Tenderness starts to decrease as temperatures reach 104°F (40°C). Longer cooking at lower temperatures makes meat, especially the tougher cuts, more tender by breaking down the collagen, which often gelatinizes during cooling.

Flavor Changes: Natural compounds in meat yield that characteristic meat flavor, but other factors contribute to flavor as well, including protein coagulation, melting and breakdown of fats, organic acids, and nitrogen-containing compounds. The trace amount of carbohydrates in meat contributes to the special flavor of browned meat surfaces as these sugars react with proteins in the Maillard reaction, producing the desirable brown color. Storing meat for more than 2 days in the refrigerator or heating leftover meat can result in an unfavorable warmed-over flavor (WOF), which is best avoided by reheating the meat in a microwave oven

Fat content: Meats high in fat, such as Prime beef or lamb, are generally cooked without added fat, such as by roasting or broiling. Meats low in fat, such as veal, is often cooked with added fat to prevent dryness. Sautéing, pan-frying, or braising is generally preferable to broiling for veal chops that are cooked well done. Fat can be added to lean meats in two ways:

- **Barding**-Tying slices of fat, such as pork fatback, over meats with no natural fat cover to protect them while roasting.
- **Larding**-Inserting strips of fat with a larding needle into meats low in marbling.

- **Basting**- lapping fat or oil over cooking meat while roasting to prevent it from drying up and to increase the colour and flavour. Color Changes: Meat pigments change color as the meat is cooked.

Doneness can be determined by observing the following colors in red meats:

1. **Rare** Strong red interior. Rare meat does not reach a final internal temperature considered microbiologically safe.
2. **Medium.** Rosy pink interior and not quite as juicy as a rare piece of meat.
3. **Well done.** Brown interior. No traces of red or pink left. Moist, but no longer juicy

Factors That Make Meat Tender

1. Moist heat: white connective tissue called collagen, changes into gelatin when moist heat is applied to it. Yellow connective tissue is called elastin, and this does not change by cooking or marinating. It should be either discarded or finely minced or chopped, which breaks it down.

2. Use of tenderizers: they make the meat tender. Commercial tenderizers contain proteolytic enzymes, such as papain, and enzyme found in raw papaya and its leaf. Raw papaya paste when applied to meat helps to tenderize it. Other acidic foods like pineapple, fruit and tender leaves, vinegar, tomatoes, curd, tamarind also helps to tender meat tender.

3. Ripening and aging of meat: meat should not be eaten immediately after killing as rigor mortis sets in and stiffens the muscles. The muscles is hung in cool conditions 10- 20C(34-360F), the time period varies depending upon the type of meat, i.e beef, mutton, etc. There is improvement in tenderness, flavour, moisture and colour in the meat. Veal and pork are not hung.

4. **Marinating:** tough meats are soaked in an acidic solution, i.e, wine, curd, lemon juice or vinegar to make the meat tender and enhance flavour.

5. **Mechanical:** pounding and grinding is done to meat to break down the connective tissue. Grinding breaks and cuts the muscle fibres and connective tissues making it possible for all ground meats to be prepared in a fashion similar to that used for tender cuts. Pounding is used to tenderize the meat; this process breaks and tears only the surface meat fibres and connective tissue

Cooking methods of Meat

a. **Dry-Heat Preparation:** Tender cuts are usually prepared by one of the dry-heating methods: roasting (baking), broiling, grilling, pan-broiling, and frying.

Roasting: Roasting is the heating of moderate-to large, tender cuts of meat in the dry, hot air of an oven

Broiling, grilling, and pan-broiling: Broiling and grilling are dry-heat cooking methods, which use very high heat to cook meat quickly. Properly broiled meats have a well-browned, flavorful crust on the outside, and the inside is cooked to the desired doneness and still juicy. Only high-quality, tender cuts with a good fat content should be broiled

Sautéing, pan-frying, and deep-frying are suitable for tender, small pieces of meat that are low in fat or that have a breaded coating.

b. **Moist-Heat Preparation:** Less tender cuts of meat, which tend to come from more heavily exercised muscles or older animals, are usually prepared by moist-heat methods such as braising, simmering/stewing, or steaming.

Braising: Braising consists of simmering meat, in a covered pan, in a small amount of water or other liquid. It is ideal for less tender cuts such as beef

chuck, round steak, and flank steak, because braising breaks down collagen and tenderizes the meat. Braising can transform a meat's texture from tough to fork-tender

Simmering or Stewing: Meats are not often simmered. Part of the reason simmered meats are not as popular may be that they lack the kind of flavor produced by browning with dry heat. However, simmering is used effectively for less tender cuts for which browning is not desired or not appropriate.

Steaming: Steaming exposes food directly to moist heat. Meats can be steamed in a pressure cooker or in a tightly covered pan. They can also be wrapped in aluminum foil or placed in a plastic oven bag, which is then placed in a heated oven. Oven bags are heat-resistant nylon bags made to withstand oven temperatures in order to provide steam to foods that are being roasted. They are used to cook a variety of foods, but are most often used for cooking large cuts of meat such as turkey, ham, or beef roast.

Microwaving: Microwave ovens are usually not the best option for cooking meats, except for thawing and reheating leftovers. They decrease juiciness, do not brown, and do not heat sufficiently to kill pathogens

c. Fish preparation

As are meats and poultry, seafood's are valuable sources of good quality protein, with fish averaging 18 to 20% of this important nutrient. Many fish are lower in fat and cholesterol than moderately fat beef. During fish preparation coating and marination can be used.

Coating: This is when the fish – either whole or in portions – is covered in an outer coating of batter, flour, egg and breadcrumbs or seasoned flour. The purpose of coating is:

- To enhance the appearance of the fish dish

- To meet recipe requirements
- To protect the delicate flesh inside

Marinating: Marinating is a technique used to flavour fish. It can be done by combining a cooked or uncooked liquid or paste with the fish in a dish. The liquid or paste is called a marinade. It contains ingredients which will alter and enhance the flavour of the fish which is being marinated. The fish can be left in the marinade for short or long periods. The fish should be covered completely by the liquid or paste

COOKING METHODS

Boiling: Boiling is the most common method of cooking shellfish. Fish are not usually boiled – poaching is the more appropriate technique.

Steaming: All types of fish and shellfish are suitable for steaming. Steamed fish is often eaten by people on diets or people who are unwell because it ensures maximum nutritional content.

Poaching: Poaching is a common cooking method for fish. The amount of liquid used depends on the size of the fish cut or the shellfish to be cooked. A whole salmon will clearly need more liquid than a salmon dorne. The equipment used to poach fish should be a heavy-based pan with a lid, or a lipped tray, which will hold liquid. If using a tray, place buttered greaseproof paper over the food to keep the fish moist and prevent it from drying out

There are two types of poaching:

Deep poaching and shallow poaching.

Deep poaching is when a whole fish or cut is totally immersed in a special pan called a fish kettle. The skin is left on to protect the flesh of the fish but

it is removed later on. The liquid in which the fish or shellfish is poached is more acidic than when poaching in the conventional manner.

Shallow poaching is when the fish or cut is placed in a tray or pan. Liquid, either stock or milk is added but does not cover the whole fish or cut. The liquid is brought to the boil the dish may be finished in the oven. Before putting the dish in the oven, a cartouche (buttered piece of greaseproof paper) is placed over the fish to keep the steam in and to keep the fish moist during cooking.

FRYING

Deep-frying: Fish or shellfish are usually coated in a batter (fish and chips) or breadcrumbs before being deep-fried. These coatings provide a crisp texture to fish and shellfish and protect them from being damaged by the hot oil.

Shallow-frying: Shallow-frying can make a fish or shellfish dish more appealing and also add colour to the product.

Grilling: Overcooking fish or shellfish by grilling will make them dry. Most fish are suitable for grilling, as are crustaceans like prawns. Other shellfish like cockles, whelks and mussels are not usually grilled

Serving Fish

Fish and shellfish are high-risk foods. They must be cooked to a temperature of 63°C or above (except for oysters which are eaten raw). Once cooked and held at service temperature of 63°C, fish will dry out quickly. Therefore it is important to cook and serve fish and shellfish as required or to order. Garnishes for fish and shellfish are specific to the dish requirement. Garnishes are used to make the finished dish look more appealing. Accompaniments are other sauces or foods used to enhance the

finished dish, or are simply good to eat with the cooked fish. Some traditional garnishes and accompaniments for fish and shellfish:

- Tomato sauce (accompaniment)
- Lemon slices or wedges (garnish)
- Parsley chopped or deep-fried (garnish)
- Tartare sauce (accompaniment)
- Brown bread and butter (accompaniment)
- Hollandaise sauce (accompaniment)
- Beurre noisette (accompaniment).

Purchasing Fish

Market forms

- 1. Whole fish-** this is the fish as it is caught, completely intact.
- 2. Drawn fish-** the guts are removed, but head, tail, and the fins are still intact.
- 3. Dressed fish-** the guts, fins and the scales are removed. The head and tails may also be removed, depending upon the fish. Also known as pan-dressed.
- 4. Steaks-** these are cross section cuts, with a portion of the backbone in each cut. The skin is not generally removed. Steaks are usually available from large round fish.
- 5. Fillets-** this is the boneless piece of fish, removed from the either side of the backbone. The skin may or may not be removed.

VEGETABLES, CUTS AND COOKERY

Vegetables refer to plants or parts of plants that are used as food. Vegetables may consist of the entire plant, as, for example, the beet; the stem, as asparagus and celery; the root, as carrot and turnip; the underground stem, or tuber, as the white potato and onion; the foliage, as cabbage and spinach; the flower of the plant, as cauliflower.

Different Vegetable Cuts

a) **Chiffonade**- very finely sliced or shredded leafy vegetables used as garnish or base for cold food presentation.

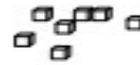
b) **Roundel's**- round, disc shaped cut from cylindrical piece of vegetable.

c) **Diagonals**- are oval shaped slices or elongated slices cut from cylindrical piece of vegetable



Chopping- uneven small cuts

d) **Brunoise**- fine dices- $1/8'' \times 1/8'' \times 1/8''$ or small dice $1/2''$



e) **Macedoine**- $1/2$ cm or $1/4''$ dices



f) **Julienne**- very thin strips of $1/8'' \times 1/8'' \times 1 \frac{1}{2}''$

g) **Shredding**- thin slices of uneven sized shreds

h) **Jardinière**- baton shape- $1'' \times 1/4'' \times 1/4''$



i) **Batonnet**- $1/4'' \times 1/4'' \times 1/4''$



j) **Paysanne**- $1/2'' \times 1/2'' \times 1/4''$

k) **Wedges**- tomato or lemon cut into moon shape



l) **Mirepoix**- rough diced vegetables such as onions, carrots, celery and leeks

m) **Bretonne**- $1''$ cubes



n) **Delmonico**- $3/8''$ cube



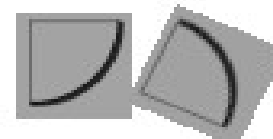
o) **Chateaux / Tournier**- barrel shaped



p) **Straw**- $1/10'' \times 2''$



r) **Pont neuf**- $1'' \times 1'' \times 2 \frac{1}{2}''$



s) **Fermier** -irregular shape, varied diameter; thickness as needed.

Cooking of Vegetables

Reasons for cooking vegetables are:

- a. To make them easily digestible- as the fibers breakdown with the effect of heat.
- b. To make them easily mastic able- can be chewed easily
- c. Equal distribution of minerals and nutrients in all parts of the vegetables- as some useful ingredients are present in the skin of the vegetables and when they are cooked, they dissolve in water and get inserted in the flesh of the vegetables.
- d. All harmful bacteria and microorganisms are killed with the effect of the heat.
- e. To preserve them.
- f. To improve color and texture of the vegetable.
- g. To improve the flavor and palatability of the vegetable.
- h. To remove harmful alkaloids.
- i. Vegetables should be cooked just before service, so that they are not overcooked and have become soggy.

Preparation of Vegetables before Cooking

- a) All vegetables should be washed before cooking
- b) All scars, bruises and wounds should be trimmed before preparation.
- c) Vegetables should be cut in uniform shape and sizes for even cooking and to retain flavour, nutrients and colour.
- d) Remove all eyes, heads, from the vegetables.

e) All vegetables which has high iron content or those which are grown must be generally immersed in water after cutting, to avoid oxidation, which will result in browning and dull appearance

f) Steaming vegetables conserves the maximum amount of nutrients by subjecting the vegetables to the least amount of heat. Vegetables are cut into small pieces for quicker steaming.

a. Controlling Texture Changes

Changing texture is one of the main purposes of cooking vegetables.

Fiber; The fiber structures of vegetables (including cellulose and pectines) give them shape and firmness. The amount of fiber varies in different vegetables. Spinach and tomatoes have less fibre than carrots and turnips. The tender tips of asparagus and broccoli have less fiber than their tougher stalks.

FIBER IS MADE FIRMER BY

1. Acids. Lemon juice, vinegar, and tomato products, when added to cooking vegetables, extend the cooking time.

2. Sugars. Sugar strengthens cell structure. You will use this principle primarily in fruit cookery. For firm poached apples or pears, for example, cook in heavy syrup. For apple sauce, cook apples until soft before sweetening.

FIBER IS SOFTENED BY

1. Heat. In general, longer cooking means softer vegetables.

2. Alkalies. Do not add baking soda to green vegetables. Not only does it destroy vitamins but it also makes the vegetables unpleasantly mushy.

3. Starch. Starch is another vegetable component that affects texture

b. Controlling Flavour Changes

Many flavors are lost during cooking by dissolving into the cooking liquid and by evaporation. The longer a vegetable is cooked the more flavor it loses. Flavor loss can be controlled in several ways:

1. Cook for as short a time as possible.
2. Use boiling salted water. Starting vegetables in boiling water shortens cooking time.
3. The addition of salt helps reduce flavor loss.
4. Use just enough water to cover to minimize leaching.
- . 5. Steam vegetables whenever appropriate. Steam cooking reduces leaching out of flavor and shortens cooking time

c. Controlling Colour Changes

It is important to preserve as much natural color as possible when cooking vegetables. Because customers may reject or accept a vegetable on the basis of its appearance, it can be said that its visual quality is as important as its flavor or nutritional value. Pigments are compounds that give vegetables their color. Different pigments react in different ways to heat and to acids and other elements that may be present during cooking. Controlling colour change for different types of vegetables includes:

a. White Vegetables: Pigments called anthoxanthins and flavonoids range from pale yellow to white. These are the primary coloring compounds in potatoes, onions, cauliflower, and white cabbage and in the white parts of such vegetables as celery, cucumbers, and zucchini. White pigments stay white in acid and turn yellow in alkaline water. To keep vegetables such as cauliflower white, add a little lemon juice or cream of tartar to the cooking

water. (Don't add too much, though, as this may toughen the vegetable.) Covering the pot also helps keep acids in. Cooking for a short time, especially in a steamer, helps maintain color (and flavor and nutrients as well). Overcooking or holding too long in a steam table turns white vegetables dull yellow or gray.

b. Red Vegetables: Red pigments, called anthocyanins, are found in only a few vegetables, mainly red cabbage and beets. Blueberries also are colored by these red pigments. (The red color of tomatoes and red peppers is due to the same pigments that color carrots yellow or orange.) Red pigments react very strongly to acids and alkalis. Acids turn them a brighter red. Alkalis turn them blue or blue-green (not a very appetizing color for red cabbage). Red beets and red cabbage, therefore, have their best color when cooked with a small amount of acid. Red cabbage is often cooked with tart apples for this reason. When a strongly acid vegetable is desired, as for Harvard beets or braised red cabbage, add just a small amount of acid at first. Acids toughen vegetables and prolong cooking time. Add the rest when the vegetables are tender. Red pigments dissolve easily in water. This means

1. Use a short cooking time. Overcooked red vegetables lose a lot of color.
 2. Use only as much water as is necessary.
 3. Cook beets whole and unpeeled, with root and an inch of stem attached, to protect color. Skins easily slip off cooked beets.
 4. When steaming, use solid pans instead of perforated pans to retain the red juices.
 5. Whenever possible, serve the cooking liquid as a sauce with the vegetable.
- Green Vegetables:** Green colouring, or chlorophyll, is present in all green plants.

c. Green vegetables: are common in the kitchen, so it is important to understand the special handling required by this pigment. Acids are enemies of green vegetables. Both acid and long cooking turn green vegetables a drab olive green. Protect the color of green vegetables by

1. Cooking uncovered to allow plant acids to escape.
2. Cooking for the shortest possible time. Properly cooked green vegetables are tender crisp, not mushy.
3. Cooking in small batches rather than holding for long periods in a steam table
4. Steaming is rapidly becoming the preferred method for cooking green vegetables. Steam cooks food rapidly, lessens the dissolving out of nutrients and flavor, and does not break up delicate vegetables. Overcooking, however, can occur rapidly in steamers.
5. Do not use baking soda to maintain green color. Soda destroys vitamins and makes texture unpleasantly mushy and slippery

d. Yellow and Orange Vegetables: Yellow and orange pigments, called carotenoids, are found in carrots, corn, winter squash, rutabaga, sweet potatoes, tomatoes, and red peppers. These pigments are very stable. They are little affected by acids or alkalis. Long cooking can dull the color, however. Short cooking not only prevents dulling of the color but also preserves vitamins and flavors.

d. Controlling Nutrient Losses

Vegetables are an important part of our diet because they supply a wide variety of essential nutrients. They are our major sources of vitamins A and C and are rich in many other vitamins and minerals. Unfortunately, many of these nutrients are easily lost.

Six factors are responsible for most nutrient loss:

1. High temperature.
2. Long cooking.
3. Leaching (dissolving out).
4. Alkalies (baking soda, hard water).
5. Plant enzymes (which are active at warm temperatures but destroyed by high heat).
6. Oxygen.

Some nutrient loss is inevitable because it is rarely possible to avoid all of these conditions at the same time. For example,

- Pressure steaming shortens cooking time, but the high temperature destroys some vitamins.
- Braising uses low heat, but the cooking time is longer.
- Baking eliminates the leaching out of vitamins and minerals, but the long cooking and high temperature cause nutrient loss.
- Boiling is faster than simmering, but the higher temperature can be harmful and the rapid activity can break up delicate vegetables and increase loss through leaching
 - Cutting vegetables into small pieces decreases cooking time, but it increases leaching by creating more exposed surfaces.
 - Even steaming allows some leaching out of nutrients into the moisture that condenses on the vegetables and then drips off

Purchasing Fresh Vegetables

In general, many fresh commodities must necessarily be shipped in firm condition, such as pears, tomatoes, cauliflower, avocados and tomatoes. Better retailers are conditioning these products to just the stage of ripeness the consumer likes - by the time they arrive at the point of sale.

1. Check the characteristic signs of freshness such as bright, lively color and crispness. Vegetables are usually at their best quality and price at the peak of their season.

2. Demand freshness! Check the characteristic signs of freshness such as bright, lively color and crispness. Vegetables are usually at their best quality and price at the peak of their season.

3. Buy mature fruit. A green peach or nectarine, for example, will not ripen but merely soften some and wither.

4. Handle with care. Fresh fruits and vegetables, because of their perishability, require constant attention to keep their fresh appearance..

5. Use thoughtful care to prevent injury to vegetables.

6. Avoid decay. It's a waste of money to buy fresh vegetables affected by decay.

Storage of fresh vegetables

Besides saving nutrients, proper storage and preparation can prevent harmful bacteria from making food unsafe for consumption.

- a) The length of time raw vegetables are stored, as well as storage temperature and humidity, affects retention of their nutrients.

- b) Vegetables such as spinach, broccoli, and salad greens need to be refrigerated promptly in the vegetable crisper or in moisture-proof bags.

- c) Cabbage should not be allowed to dry out. If it is to be held for a few days, wrap it or put it in the vegetable crisper where the humidity is high
- d) Green peas and green French beans hold their nutrients better if left in their pods until ready to use. If shelled, put them into plastic bags before storing in the refrigerator
- e) Tomatoes bought or picked before they turn red keep their nutrients best if ripened out of the sun at temperatures from 60 to 75 degrees
- f) Carrots, sweet potatoes, potatoes, and other roots and tubers retain their most important food values reasonably well if kept cool and moist enough to prevent withering.